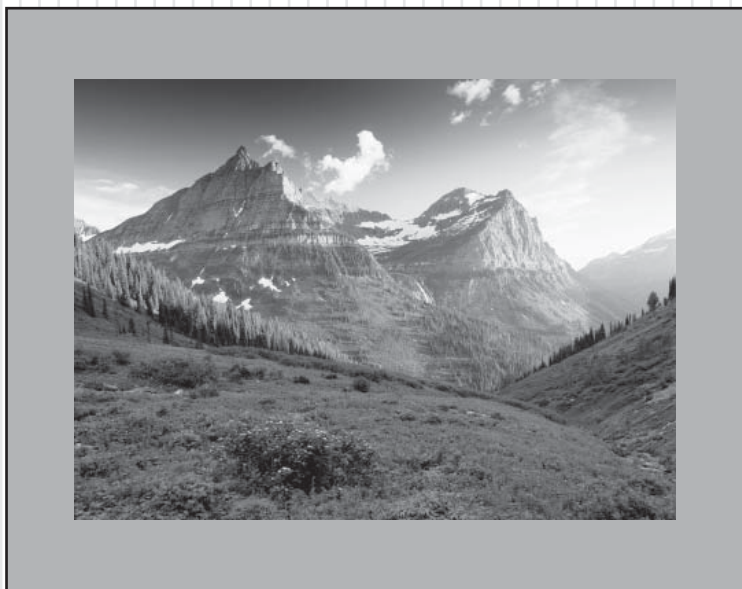# *Montana Comprehensive Assessment System* (MontCAS, Phase 2)

Criterion-Referenced Test (CRT)

COMMON CONSTRUCTED-RESPONSE ITEM RELEASE
MATHEMATICS, GRADE 7

2009

OPI

OFFICE OF PUBLIC INSTRUCTION

You may use a calculator during this session.

Write your answer in the space provided for it in your Student Response Booklet.

73. A research company conducted a food allergy study.

   a. In the study, 15 out of 1,500 men were allergic to wheat. What percent of the men were allergic to wheat? Show or explain how you know.

   b. In the same study, 5 out of 2,000 women were also allergic to wheat. The population of a city includes approximately 198,000 men and 214,000 women. Based on the research company's data, how many men and women in this city can be expected to be allergic to wheat? Show or explain how you know.

Scoring Guide

Score	Description
4	4 points
3	3 points
2	2 points
1	1 point or Student demonstrates minimal understanding of percents.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Scoring Notes

Part a: 2 points   for the correct answer, **Men: 1%**, with work or explanation

                  OR

                  1 point   for a correct answer with no work

                                    or

                                    for correct strategy but the answer is incorrect

Part b: 2 points   for the correct answer, **1,980 men and 535 women**, or **2,515 men and women**, with appropriate work or explanation

                                    Note: Students can get full credit for giving both amounts separately or the sum of the amounts.

                  OR

                  1 point   for the correct answer, with no work or explanation

                                    or

                                    for correct strategy shown, but there are computation errors

Sample Response:

Men: 1% of 198,000 = 1,980
Women: $5/2{,}000 = x/214{,}000$ $1/400 = x/214{,}000$ $4x = 2{,}140x = 535$
Men + women: 1,980 + 535 = 2,515, but not necessary to find sum

a.

$$\frac{115}{1800} \div \frac{15}{15} = \frac{1}{100} \qquad 100 \overline{)1.00} \quad 0.01$$

1% of men are alergic to wheat.

b. $\frac{5}{2000} \div \frac{5}{5} = \frac{1}{400} \quad 400 \overline{)1.000} \quad 0.0025$
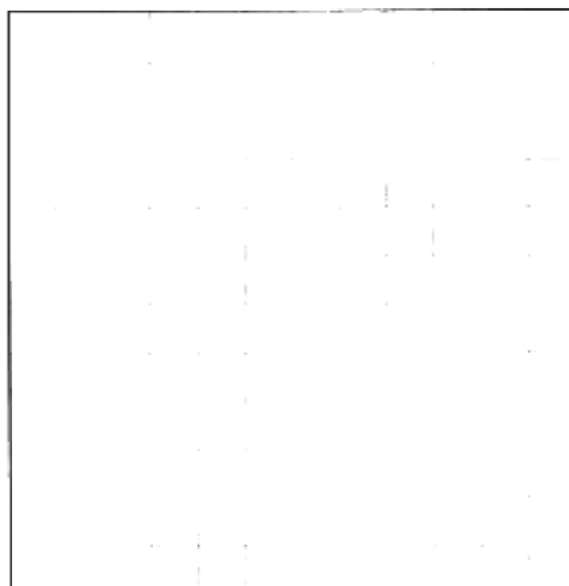
0.25% of women have it.

$$\begin{array}{r} 214{,}000 \\ \times \ 0.0025 \\ \hline 535 \end{array} \qquad \begin{array}{r} 198{,}000 \\ \times \quad 0.01 \\ \hline 19{,}800.69 \end{array}$$
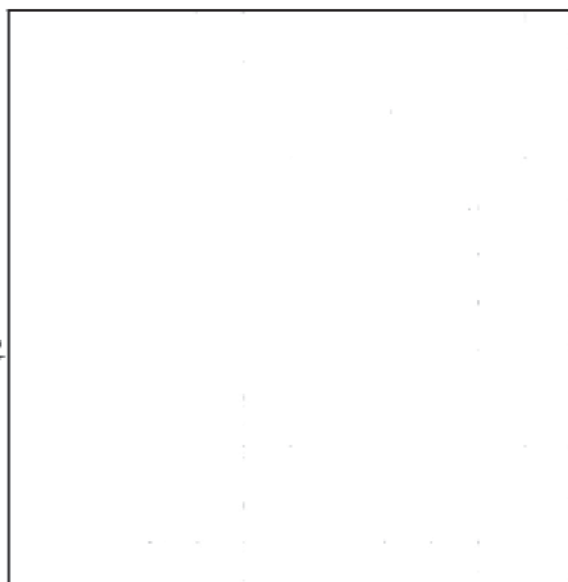
women: 535

men: 1980

a. $\dfrac{15}{1500} \cdot \dfrac{5}{5} \cdot \dfrac{3}{300}$ $\dfrac{3}{300} \div \dfrac{3}{3} = \dfrac{1}{100}$ or 1%

b. $\dfrac{5}{2000} \div \dfrac{5}{5} = \dfrac{1}{400} = .25\%$

198,000 $\cdot$ 0.01 = 1980 men

214,000 $\cdot$ 0.0025 = 535 women

I Know that 1980 men in the city will have alergies to wheat because 1% of 198,000 is 1980. I Know that 535 women will have allergies to wheat because .25% of 214,000 is 535.

A. 1% of were allergic to wheat. How I know this is because 15 is $\frac{1}{100}$ of 1500. Then you make $\frac{1}{100}$ into a decimal which is 0.01 then you multiply 0.01 by 100 to get the percent of men who are allergic to wheat.

B. 19,835 men and women are allergic to wheat in this city. How I know this because 0.25% of women are allergic to wheat. So you would multiply 214,600 by 0.25% and got 536.
Then you multiply 196,000 by 1% and get 19,600.
Then you add 19,800 with 535 then you have your answer
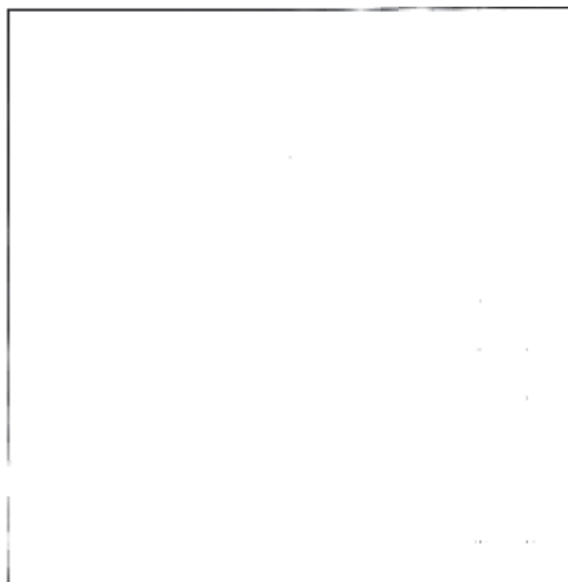
a- $\frac{15}{1500} = \frac{X}{100}$

$\frac{1500}{1500} = \frac{1500X}{1500}$

$1 = .01$ $\boxed{1\%}$

b- 1% of $198000 =$

1980 men
53500 women

$\frac{5}{2000} = \frac{X}{100}$

$\frac{500}{2000} = \frac{2000X}{2000}$

$.25 =$
25% of 214,000

$\begin{array}{r} 1980 \\ + 53500 \\ \hline \boxed{55480} \text{ allergic to} \\ \text{wheat} \end{array}$
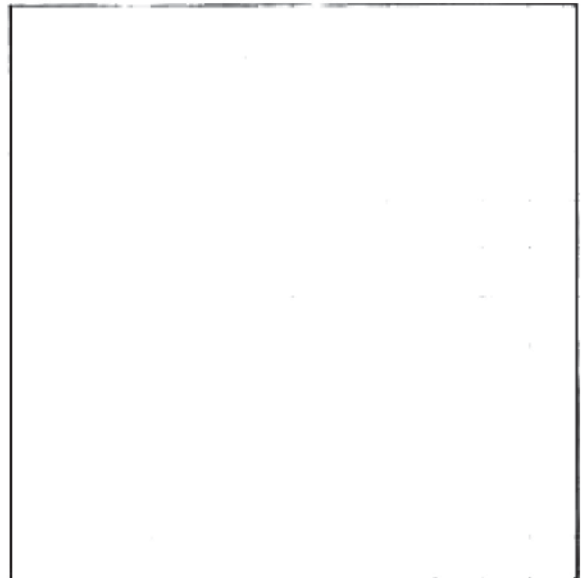
A. $\dfrac{15}{1500} = \dfrac{x}{100}$ $x = \underline{1}\%$

B. $\dfrac{20}{3500} = \dfrac{x}{412000}$ $x = 2,354$ people will be allergic to wheat.
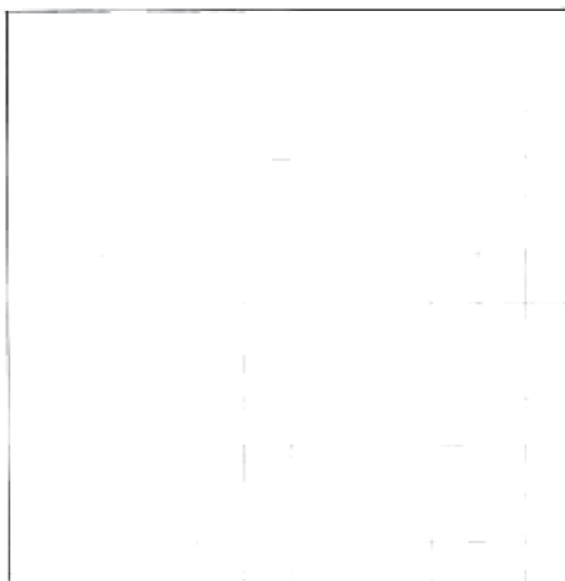
A. 15 percent of men were allergic to wheat because 1300 is the whole value, and 15 men were allergic, so the answer is 15 percent were allergic to wheat

B. 214,000
÷ 2000
107
× 5

535 women

198,000
÷ 1500
132
× 15

1980 men

A.) 10% of the mere were allergic to wheat.
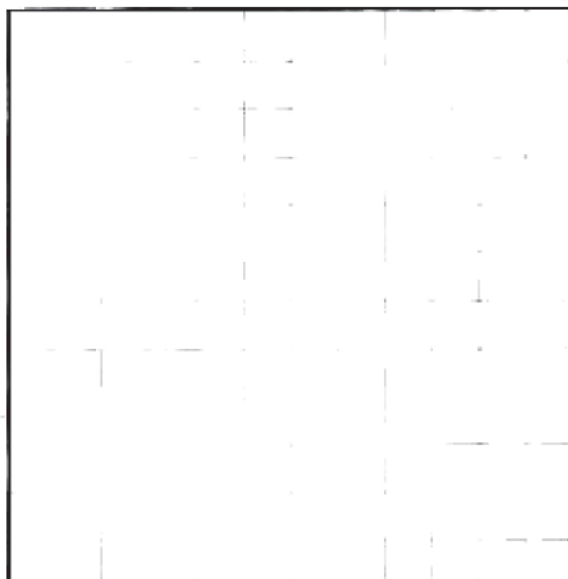
$$1500\overline{)15,000}$$ .010
$$\underline{-1500}$$
$$0$$

B.) 239 people in this town are allergic to wheat.

$$15,000\overline{)198,000}$$ 132

$$2,000\overline{)214,000}$$ 107
$$\underline{-214,000}$$
$$0$$

132
+107
(239)

a 1% becoase you dewidl both numes
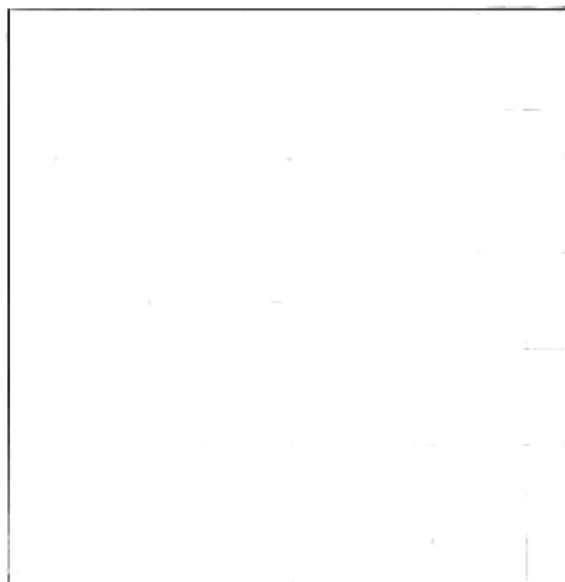
6. 10 300 = 5 %
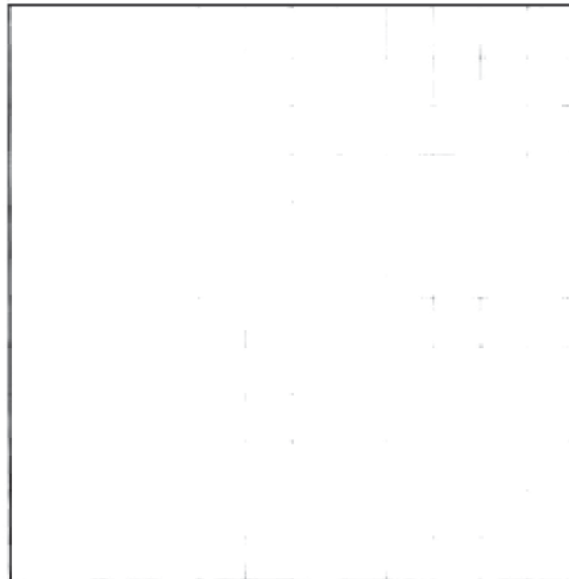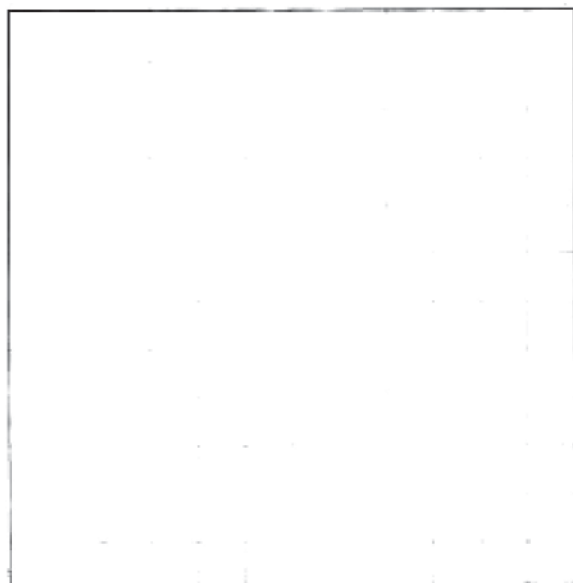
A). 25% because 150 is half so 15 must be 25%.

B). 50% beause 25% of women are alergic and men are 25% also so 25 + 25 = 50%.

A) 15 out of 1,500 men were allergic to wheat which is 15% out of 1,500. 15 − 1,500 = 225 men

B.) 5 out of 2000 women were allergic to wheat. I would say my best guess would be about 28 people would be allergic to wheat in this city or maybe even 50 people could be alligic.